AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A heterostructure bipolar transistor ~~characterized in that constituent devices of a compound semiconductor forming a base layer contain at least Ga, As, and Sb, and constituent devices of a compound semiconductor forming an emitter layer contain at least In, Al, and P.~~, comprising:

a substrate made of InP;

a collector layer formed on said substrate and made of a compound semiconductor containing indium and phosphorus;

a base layer formed on said collector layer and made of a p-type compound semiconductor containing gallium, arsenic, and antimony, said base layer containing carbon added as a dopant;

an emitter layer formed on said base layer and made of a n-type compound semiconductor containing indium, aluminum and phosphorus;

wherein at least one $GaAs_{(x)}Sb_{(1-x)}$ layer is used in said base layer and at least one $In_{(1-y)}Al_{(y)}P$ layer is used in said emitter layer, where x and y represent an As content and an Al content, respectively, in a mixed crystal composition;

wherein said As content x is in the range of $0.45 \leq x \leq 0.55$ and said Al content y is in the range of $0 < y \leq 0.25$, with x and y satisfying the formula $0.49x+1.554y>0.36$;

wherein a composition ratio of indium to aluminum in said emitter layer is in a range within which a potential energy in a conduction band edge of said emitter layer close to said base layer side is higher than that in a conduction band edge of said base layer.

2-6. (Cancelled)

7. (Original) A heterostructure bipolar transistor according to claim 1, characterized in that the composition ratio of Al in said emitter layer decreases away from said base layer.

8. (Original) A heterostructure bipolar transistor according to claim 1, characterized in that the composition ratio of As in said base layer decreases away from said emitter layer.

9. (Original) A heterostructure bipolar transistor according to claim 1, characterized in that said collector layer is made of a compound semiconductor containing indium, aluminum, and phosphorus.

10. (Original) A heterostructure bipolar transistor according to claim 9, characterized in that

said base layer is made of $GaAs_{(x)}Sb_{(1-x)}$,

said collector layer is made of $In_{(1-z)}Al_{(z)}P$, and

x and z represent mixed crystal compositions and fall within ranges of $0<x<1$ and $0<z<1$, respectively.

11. (Currently Amended) A heterostructure bipolar transistor according to claim 10, ~~characterized in~~wherein:

~~that~~said content z is in the range of ~~the composition y is~~ $0<~~y~~z\leq 0.18$~~,~~; and

~~the relationship between x and y is~~said contents x and z satisfy a formula $0.49x+1.554z\leq 0.36$.

12. (Original) A heterostructure bipolar transistor according to claim 9, characterized in that the composition ratio of Al in said collector layer decreases away from said base layer.

13. (Currently Amended) A heterostructure bipolar transistor according to ~~claim 1~~claim 10, ~~characterized in that~~wherein:

layers including said base layer and emitter layer forming the heterostructure bipolar transistor are formed by metal organic chemical vapor deposition~~, and~~

~~carbon is doped as a dopant to said base layer~~.

14. (Original) A heterostructure bipolar transistor according to claim 13, characterized in that said base layer is formed at a growth temperature of not less than 480 °C.